DOCUMENT RESUME

ED 445 187 CE 080 629

AUTHOR Thorpe, Mary
TITLE New Technology and Lifelong Learning.
PUB DATE 2000-07-00
NOTE 16p.
AVAILABLE FROM For full text: http://www.open.ac.uk/lifelong-learning/papers/393CCEC3-0008-67C6 -0000015700000157_MaryThorpepaper.docv5.0.doc.
PUB TYPE Information Analyses (070)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Access to Education; Adult Education; *Adult Learning; Computer Uses in Education; Counseling Services; Cultural Influences; Definitions; Delivery Systems; Distance Education; Education Work Relationship; Educational Needs; Educational Quality; Educational Research; *Educational Technology; Educational Trends; Educationally Disadvantaged; Equal Education; Foreign Countries; Instructional Design; *Instructional Effectiveness; Internet; *Lifelong Learning; Literature Reviews; Needs Assessment; Open Universities; Outcomes of Education; Participation; Postsecondary Education; Research Needs; Special Needs Students; *Technological Advancement; Telecommunications; Trend Analysis; Vocational Education; World Wide Web
IDENTIFIERS Africa; Australia; Canada; Impact Studies; *United Kingdom

ABSTRACT

Key issues related to the relationship between new technology and lifelong learning in the United Kingdom and elsewhere were identified through reviews of the literature on information and communications technology (ICT) and the literature on lifelong learning. Two overarching issues related to the interplay of new technology and lifelong learning were identified. The first is the issue of access and participation, and the second is the issue of the effectiveness of learning once the barriers of access have been overcome. Although new ICT options offer a way around the distance and time barriers that prevent many adults from participating in lifelong learning, these new options are unlikely to be available to learners from disadvantaged or low-income social groups, workers in low-skilled jobs, and unemployed individuals. The new technologies do, however, offer advantages for learners with disabilities, and they have the potential to improve learners' access to information and guidance. Furthermore, ICT-based materials can be designed to build on all modes and stages of learning. However, more research is needed to determine ICT's effectiveness in supporting learning outcomes for predegree and vocational qualifications and to determine the interplay of cultural factors, personal identity, ICT, and lifelong learning. (Contains 28 references.) (MN)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 445 187

NEW TECHNOLOGY AND LIFELONG LEARNING

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

M. Thorpe

Mary Thorpe

Institute of Educational Technology

The Open University

1

The purpose of this paper is to identify key issues and questions arising from the research into new technology applications, focusing specifically on lifelong learning. However, because research into new technologies tends to be sector specific, or particular to local applications and initiatives, the implications for lifelong learning need to be constructed tentatively, rather than read off directly. There are also two broad literatures that currently connect hardly at all; the literature of Information and Communications Technology (ICT) and that of adult education. There is a risk that the former will dominate, given the powerful role that technology application plays in analyses of why lifelong learning should be both necessary and also achievable. Indeed, as Field and Schuller have argued, some of the research now relevant to the field of lifelong learning, pointedly does not engage with the adult education literature (Field and Schuller, 1999).

Research and evaluation of applications of 'new technology' in teaching and learning, has well established fields of literature and practice which now display a marked confidence. Its proponents have shown little inclination to integrate the theoretical perspectives of Duguid, Jonassen, Vygotsky and Pask with those of Freire, Knowles, Brookfield et al. As Edwards has aptly characterised it, adult education is suffering something of an identity crisis, just at the moment when its time might be seen to have arrived (Edwards, 1997, Field and Schuller, 1999).

New Technology

'New technology' is also itself a shorthand reference to applications of communications and information technology which are changing so rapidly that the risk of generalising from what is known now, is that new applications simply by-pass current experience and render their conclusions outdated. Furthermore, the research on which this paper is based does not represent a systematic coverage of what is in use. Research and evaluation studies reflect the opportunities of available staff and funding, and are not always targeted on issues of importance for lifelong learning, such as informal learning, or qualifications relevant to disadvantaged groups. There is also a 'technology lag' in terms of penetration within particular sectors and discipline areas.

The title of this paper also requires comment. 'New technology' is being used here to refer to the Internet, the World Wide Web, electronic communication and other computer based applications. We point forward to the promise of television and hand held devices for providing Web and communications functions in future. However learning opportunities which involve nothing but computer-based study are still a relatively rare phenomenon. Computer based applications are usually the most high profile element in innovative practice but they often absorb a relatively minor proportion of learner study hours, and may be used by learners as adjuncts to more familiar print, or campus based provision.

However it is the electronic delivery of information and interactive communication which is fuelling the current resurgence of lifelong learning. Distance education based on print, tutor support, and perhaps limited audio and video resources, is no longer the latest technology,

CE 080 629

BEST COPY AVAILABLE

although it may well still be 'new technology' for many. Spokespersons for the e-University idea for example, announced that conventional distance education approaches would be likely to form the early basis for developments (THES, April 25th. 2000).

Evaluation of the outcomes of student experience with applications of computer mediated communication (CMC) and the World Wide Web have increased noticeably, in HE institutions particularly. 'Virtuality' is not yet a commonly available mode of teaching and learning. But it is here now and in use by small numbers of people, who can use their workstation to participate in real time events where learners interact on-line, from geographically dispersed locations, using streaming audio and video as well as reading words and graphics on screen.

Participation in this kind of 'new technology' is a vastly different experience from accessing CDRoms in the library of a local college. Yet both experiences might be legitimately included under the term 'New Technology'. We need to keep this breadth of experience in mind, when referring to computer based applications and also looking to the future when the television or a mobile phone might be the delivery technology.

Lifelong Learning

Turning next to definitions of 'lifelong learning', commentators from the adult education world in which it was launched via the Faure report of the seventies, view its current fashionability with some suspicion, as a public discourse 'narrowly confined within a short-term, economistic, new right frame' (West, 1998, p.237). Its very ubiquitousness, acclaimed by so many disparate groups, raises warning signs around its practical meaning. Its literal meaning suggests it should include the whole of education and training, from pre-school up to third age provision, and informal as well as formal and non-formal learning. Although such an approach is unmanageable for a short paper, it highlights the inter-relatedness of sectors otherwise kept separate. Improved articulation between these sectors is one of the values some proponents of lifelong learning would wish to see as a beneficial outcome.

However the research base I draw upon is not primarily focused on sector inter-relatedness, and adopts a more conventional emphasis on adult participation in specific sectors - FE, HE, and workbased learning and training. Data from the Open University is rather different in that its student body is so diverse in terms of both age, prior educational qualifications and location, that it gets closer to counting as a proxy for lifelong learning. Two thirds of its students are aged between 25 and 44, 35% enter with a degree or other higher educational qualifications, roughly a third have no or low formal qualifications which would not qualify them for university entry, and the remainder have a range of A level, vocational and other awards at pre-degree level. OU students also typically cite a combination of strong work-related and personal interest goals as their main reason for study – only a minority studies for purely vocational or purely academic interest. In this way too therefore, they bring together a key issue in lifelong learning – the right of adults to have access to learning opportunities which relate to their personal interests as well as to their earning capacity and the goals of their employers for more skilled employees. These points should be borne in mind where comments are made about ICT use at the OU.

Both lifelong learning and ICT literatures have access and participation as key issues. However, arguments for increased provision for adults based on liberal values and achievement of human potential have never had the power (within the UK at least) to bring investment in lifelong learning such as the promise of new technology is now driving.

Taking the FE sector as an example, since the Learning and Technology Committee of the FEFC (Higginson Report, 1996) recommended strategic investment across FE, both FEDA and BECTA

have launched major initiatives - QUILT AND FERL - which have brought a range of changes to many FE colleges. Virtually all colleges will have a learning resources centre supporting part time study, but many now have laboratories equipped with high specification PCs, scanners, cameras, authoring tools and editing equipment and software. Halton College is one such. Newcastle College has a multimedia taster course in key skills developed jointly with Gateshead and Sunderland as part of the UfI. They also have a telematics course on use of the Internet, email and video conferencing. Waltham Forest are developing an IT based basic skills course in numeracy and literacy for local carers, as well as staff development for teachers in IT use in schools. All these colleges have been involved (with FEDA funding) in development of an evaluation tool for use with their new technology applications (Jones et at, 1999). While time pressures are so great, very little evaluation is done, and 'findings' are more often anecdotal accounts of local practice.

It is also interesting to see the boundaries between public and private sectors being reduced by projects funded out of EU ADAPT and Single Regeneration monies, both aimed at supporting retraining/training in economically threatened areas. The OU along with many other providers is using ADAPT funding to find ways of channelling provision based on its course materials, into Small and Medium Enterprises (SMEs). These developments focus on computer-based delivery methods primarily, reflecting the ICT driver in current lifelong learning initiatives:
'...the information-technology revolution is creating a new form of electronic, interactive education that should blossom into a lifelong learning system that allows almost anyone to learn almost anything from anywhere at anytime.'
(Halal and Liebowitz, 1994, quoted in Kirkup and Jones, 1995)

Computers which are in the workplace now because of the demands of IT intensive production/service methods, are envisaged as delivery points for learning opportunities as well. Another interesting example of cross-sectoral investment is Connect@Sunderland, an ICT facility which aims to build links between locally based new IT intensive industries, and schools, colleges and universities in the City of Sunderland. The project includes activities such as teacher training with industrial instructors 'on the job' to make ICT relevant to both teachers and children, developing industrial links used to teach ICT with a business focus to meet national training standards, and creating a community access point bringing together industrial applications with courses provided by public sector educational institutions locally.

The co-presence of work and learning – the integration of the two – is now actively promoted by such projects and funding, not merely noticed as an interesting phenomenon for the researcher. The intention – well based or not in learning terms – is that the PC on the workdesk can be used for learning needs both essential for the job, and going beyond the current job.

To conclude this section, the title of the paper yokes together two huge areas of activity and research, and we need to be aware that much more needs to be done to articulate the relationship between the two and the areas where interests are shared and those where they contrast or run counter to each other. Having made these general observations, the remainder of the paper focuses on two over-arching issues which are priority concerns in both areas – on the one hand, access and participation, and on the other, the effectiveness of learning once the barriers of 'entry' (to learning rather than to an institution necessarily) have been overcome. Accordingly, the rest of this paper is organised under these two headings, with some general comments on the research priorities which come out of the discussion of each section.

Access, Participation, Location

The promotion of new technology by UK governments via initiatives such as the National Grid for Learning and UFI'S Learndirect, is in part because of its capacity to deliver learning resources to locations readily accessible to adult learners. This issue, of the barriers confronting all adults who wish to access learning, remains a powerful concern particularly for adults in rural or disadvantaged areas. In a recent article on access issues, Watt and Paterson for example comment to the effect that 'Location of provision and flexibility of entry and exit can make or break a student's educational career' (Watt and Paterson 1999).

The comment summarises a situation in which conventional provision is perceived as making too many demands in terms of attendance for many adults to cope with, alongside work and family roles. Yet the new technology options which offer a way out of such problems via delivery to the desktop at home or work, are also unlikely to be available to the typical 'access' learner from disadvantaged or low income social groups. Technology offers the solution in terms of delivery, yet the reality is that personal resources are required to a level beyond the reach of those who have typically been the target for access initiatives.

Resource barriers contingent on ICT delivery of learning

Computer ownership has risen rapidly, increasing from 26% of households in 1996/7, to 34% in 1998/9 (ONS, 29 and 30). Ownership however still reflects relative household wealth, not only because of the price of machines, but also telephone charges and space to house equipment. In 1996/7 there was also much lower access among one person households aged 60 and over. Households with children were much more likely to own a computer, with 49% of such households owning a computer in 1998/9 compared with 28% of one person households under 60. Similarly, households headed by a professional were more than four times more likely to own a computer than those headed by unskilled manual workers (ONS, 29 and 30).

The speed with which some sectors of the population have moved into use of the web emphasises the gap between those with average and above income levels, and the sharply reduced circumstances of those living below average income levels. During the 1980s there was an increase in inequality in the distribution of household disposable income, although this has slowed down since 1992. The proportion of people living in households with income below the average increased from 13% in 1961 to 21% in 1992 and fell to 18% in 1997/8 (ONS, 1999). In terms of participation in higher education, all socio-economic groups have higher rates in 1998/9 than in 1991/2 but the gap between the unskilled and professional groups has widened. Whereas unskilled participation has grown from 6% to 13%, that of Professionals has grown from 55% to 72% (ONS, 2000) . Whereas the gap was 49% it is now 59%.

Changes in the financial support for HE students has also disadvantaged those without resources other than state funding. The introduction of tuition fees in 1998/99 now means that the grant accounts for only a quarter of the support available, the rest made up by loan arrangements.

The polarisation between a growing population with home or work access to computers, and a minority without any form of access, impacts on ability to acquire skills in a key area linked with employment. IT skills are highlighted as essential across semi-skilled as well as professional and skilled employment. The Open University Students Association for example is keen to support the University's use of a computer platform for various aspects of study, in part to ensure that OU students keep up with these modes of study in campus based institutions, and also gain the IT skills that employers want.

The issue of access is likely to change however, when mobile phones and hand held devices, along with television, eventually provide access to telecommunications and the Web. Mobile phone

ownership has spread even more rapidly than computer ownership, with a fifth of all households in 1997/8 owning one, and two fifths of those headed by a professional. Ownership is greatest in the southeast, where three in ten households owned a mobile phone in 97/8 (ONS, 1999). BT predicts that by 2003 more people will access the Internet by phone than by personal computer (Guardian, May 9th 2000).

Educational time lag in ICT application for teaching and learning

However, the extent to which educational providers will be able to make full use of this technology is likely to suffer a time lag such as we have seen with computer based provision, inspite of government investment, certainly in universities. Over £33million has been invested in the Teaching and Learning Technology Programme since 1992. There have been three phases of project funding, as follows:

1992 – 93 phase 1 – 43 projects funded
1993 – 98 phase 2 – 33 projects funded
1998 – 2001 phase 3 – 32 projects funded

Investment is focused mainly at the level of the institution and the discipline. The current phase is attempting to learn the lessons from the first two phases, by emphasising integration with mainstream teaching, embedding ICT into teaching and learning strategies at institutional level, and continuing to promote discipline based networks and collaboration (HEFCE, 1998). A recent evaluation highlighted the limitations of what has been produced, in terms of the fact that software products are typically only designed to fit the local student population. Very little sharing or cross institutional collaboration has been initiated, although it might also be fair to say that seeking to create such a major cultural shift in periods of typically 3 to 5 years was over-ambitious.

Evaluations of TLTP and the TLTSN have shown positive outcomes in terms of increased awareness among teaching staff and a strong motivation in favour of ICT use as a means of improving the quality of students' learning. The management goal might include cost savings but teaching staff show greater awareness of the learning benefits rather than cost reduction, which in practice has not materialised. (Haywood, 1999)

Private sector/employment based access

In general, the gap between the technology rich and the technology poor has widened the disparities between adult learners. Those already employed in professional occupations are given desktop equipment which can also be used for in-house education and training as well as accredited courses enabling career development, in some cases. Those in low skilled jobs and the unemployed, are deprived of such access.

Private sector providers may charge at a level which puts their provision effectively out of reach of the less well off. Provision is also likely to relate most quickly to employment related needs for those already in the more skilled end of the market. For these reasons, the learning gap between haves and have nots, is likely to linger well beyond the wide availability of home based technologies which carry educational as well as entertainment material.

Having stressed these implications for the most disadvantaged learners economically, we should note that computer based systems have played a key role in increased access and take up of provision, conventionally delivered and otherwise. An initiative like the University for Industry is only feasible because computer systems can support call centres and learner enquiries, tracking and mailing on a mass scale. Computerised administrative systems, networked resources and

electronic communications, together with media based advertising, offer an essential means of increasing awareness and ensuring that potential learners make effective connection with providers. The telephone, not a 'new' technology in this context, has played a key role in breaking down the barrier of visiting a provider before the process can begin. Although UfI working now through 'Learndirect' as the brand name, will raise awareness of local provision that may or may not involve new technology, it has always been part of the aim of the initiative to increase the use of ICT as a vehicle for learning and gaining qualifications.

Special Needs

New technologies may be considered a weak strategy for recruiting more successfully from disadvantaged groups but they do offer advantages for one such group, namely those with a disability, which puts conventional provision out or reach. Home based study has always offered a key opportunity where mobility is restricted, and print plus video and audio technologies have been adapted by the Open University over 30 years of 'conventional' distance education, to suit the needs of both visual and hearing disabled learners.

The OU's 7,000 disabled students however face new barriers where web-based materials are concerned, unless providers adopt best practice in design for the disabled, and use enabling technologies as necessary. Screen magnification software for example can enable people with very poor sight to make effective use of course materials. Speech synthesisers linked to screen readers enable the blind to 'read' through listening. Vincent and Whalley describe the huge advantages that delivery of digital materials via either a CDRom or a Web site offers by contrast with audio cassette technology. These required human readers to transfer text onto tape, with university courses requiring maybe 60 or more tapes. Using the interface called ReadOut, a student can navigate, search and locate, index, bookmark and make notes about the material being communicated, and without the time consuming search and navigation procedures of the audio cassette (Vincent and Whalley, 1998 p.33).

There is also the hope that new technology might attract those alienated from education generally. There is concern for example about a minority of young men who fail at school and who do not want to return to any form of provision. In all ethnic groups, girls do as well as, or outperform boys at GCSE, and since 1998/9, girls have outperformed boys at A level. Enrolments on adult education courses include about three times as many women as men (CSO, 2000 pp 57-58). Watt and Paterson point out how little advice school leavers still get about their choices beyond school and emphasise the need for increased guidance provision for disadvantaged groups. They suggest that broadcast media already in use by these groups should be used to provide more information.

Student Support

The new technologies do also have the potential to improve access to information and guidance. Delivery over the Internet using a Web browser can bring into learners' homes an array of information about courses and student experience relevant to the enquirer's own situation and needs (Scott and Phillips, 1998). Multimedia narratives over the Web are being used at the Open University as part of services which can now be used by students in their own homes and at their own pace. Instead of a limited phone call between restricted hours, students can browse through student stories of challenges in studying and work with them and on-line 'advisers' to construct ideas for tackling them. Course choice can also be brought closer, as it were, by again providing at the desk top the kind of information about course content, prerequisites, assessment and fees which has only been available in rather complex documents or by contacting staff. Even the views of students who have studied the courses is included, and the technology does appear to add value in terms of convenience and in-depth work time by the learner.

RESEARCH ISSUES

A number of general points lead on from the discussion above:

Macro level monitoring of participation rates and trends

It is crucial in this area of tracking participation, to have access to reliable trend data so that the impact in terms of demographic, social class and regional factors can be monitored. The current investment in lifelong learning is not a guarantee of beneficial outcomes, and the analysis of its impact requires good data about the distribution of activity and outcomes.

The Census Office reports together with issue based surveys such as NIACE has sponsored, are essential for regular updates on the key question of who is participating, in what kinds of provision and to what effect. It will be interesting to see whether the UfI will publish data openly and in a form which supports researchers who want to find answers to questions about the rise and fall of participation by social class, employment, income and educational qualifications categories.

Micro level studies of special needs and targeted applications

In addition to the necessity of macro level studies, we should also find out how best to exploit new technologies, which offer added advantage for minority groups. Such groups include disabled learners, disaffected young men and those at risk of social exclusion. These groups are heterogeneous in their characteristics and needs, and research is needed into the design of learning opportunities which will attract each group and the diversity within them. We need to know more about how to combine the different media and technologies, and how to support effective use through support systems, which can link learners to peer groups as well as to accreditation, where these are helpful.

The Quality of the learning experience

The preferred modes of learning in adulthood are diverse. The learning process and its outcomes for each learner are divergent and unpredictable. In addition, prior experience and the pressures of day to day events play an influential role in whether, in what way and to what effect, learning takes place.

Into this context new technology brings possibilities we are only just beginning to exploit and evaluation provides evidence of both positive and negative effects on the quality of student learning. Before looking at some of these effects, it is worth commenting on the increased analysis of learning which has been prompted by the new possibilities technology offers and which is of value in its own right.

Designing ICT to support learning

Teachers now have the possibility of using a range of media and technologies and thus of deploying the particular strengths of each to their best effects. Laurillard has analysed the way in which each medium/technology supports particular aspects of the teaching/learning interaction (Laurillard, 1993). Her model of this interaction is that of a conversation or dialogue which is capable of sustaining the activities required for learning. She derives this approach from the work of Pask, among others and from a commitment to a social constructivist theory of human learning - a theory which is now dominant across the field of educational technology and ICT evaluation and development generally. It is based on the conception that the learner actively constructs

meaning, and that contextual cues and supports interact powerfully with the existing frameworks and beliefs of each learner.

Laurillard's analysis of the major media forms demonstrates their capacity to support student interaction, and to provide feedback which allows students to develop their understanding. However 'telling' or moving a text might be, it is not interactive in this sense. In principle therefore, learning providers now have a much more powerful set of 'tools' in the form of multimedia and digital technologies, with which to stimulate and sustain learning.

Squires for example uses the Kolb cycle to suggest how this might work (Squires, 2000). He argues that Kolb's four key stages in learning are often weakly developed. At the first stage of engagement in a practical, authentic activity, case studies and explanatory materials may be perceived as inauthentic by learners. The next stage of reflection on experience may be omitted altogether and links with the third stage of theoretical analysis are often rushed and superficial. Applying new learning in other situations at the fourth stage in the Kolb cycle is he argues, 'usually a broken link'.

ICT based materials can be designed to build in all four stages effectively, strengthening as well the links between each stage. Taking the first stage, learners are encouraged to be active explorers by even simple uses of the Web for information searching and document creation. Virtual Learning Environments go much further than this, creating 'spaces' in which learners have freedom to adjust parameters and observe the results. The TLTP materials for undergraduate geography studies, Virtual Field Course, for example, offer an open-ended environment based on maps, photographs of fieldwork sites and GIS systems designed to provide computer-based support for fieldwork and a visual environment for exploring spatially referenced information (http://www.geog.le.ac.uk/vfc/). Students can explore the physical landscape from their desktop, and thus make much better use of their time in the actual field. Post fieldwork analysis is also strengthened by further exploration of the measurements, physical features and topographical detail which the databases hold and which students can use to construct their own understanding of the field and its theories and models of the landscape.

Another example in the field of the Arts would be the Open University's Art Explorer, where students can create their own constructs for describing a number of art works available for them to view on a CDROM. Their appreciation of the specialist knowledge and language of the art critic is something they can play with and 'get inside' by being able to move around and re-size elements of well-known works which are the subject of the period under study. Other uses of technology may use simulation to provide a more limited range of possibilities for learners, but with potential just the same for learners to make better links between a personal grasp of the details of what is to be learned, and the theoretical accounts and models of the discipline.

Learners often have difficulty in 'holding together' or articulating relationships between the details of particular cases/examples/activities, and the theoretical and conceptual frameworks of a discipline. An introductory course on Object Oriented Computing at the Open University was able to improve the learning experience of its students by integrating via the onscreen medium, explanations of activities with the programming environment in use. Printed texts were given a different and complementary role with more reflective, discursive material, encouraging students to make links between their programming work and theories introduced in the course (Taylor, 1999).

The OU Science Foundation Course has also used simulations to help students come to grips with scientific models in ways which avoid complex and abstract calculation, and which do encourage people to visualise and use their imagination. A model of the way in which carbon moves through

different elements and thus creates the carbon cycle is for example presented as a series of screen shots where the carbon element can be moved by the learner, feedback is provided intrinsically by questioning the learner making a false move of the carbon element, and by quiz material linked with videos which summarise and test out material taught elsewhere in the study texts provided in print.

Thus simulation, offering learners an active role in working with models not just trying to memorise them, can provide authentic learning tasks and improved understanding. Some have claimed that these approaches are more motivating because they do require the learner to be active and they do build on visual as well as other imaginations. They provide new opportunities for effective links between practical experience and theory building, when used effectively.

Moving on to Stages 2, 3 and 4 of the Kolb model, CMC and email can be used to support interactions which - given the desktop technology available and advanced design skills - can encompass a very wide range of scenarios. Reflection, theory building and practical application can all be supported drawing on a rich range of possibilities. One to one with a tutor or peer, small group discussion, moderated large conferences, role playing by learners to simulate face to face genres such as debates, buzz groups, co-counselling, seminars - all these are possible via CMC. Furthermore, real time events using technologies such as Stadium and Lyceum (http://kmi.open.ac.uk/projects/stadium/#types) can also be introduced so that learners share the same moments, whatever their geographical location or time zone. Events such as these have also been found to create added motivation and social bonding, precisely because they enforce all to be present at the same time (see Bostock, 2000 for a review of virtual learning environment functionality).

Constraints on positive learning outcomes from 'new technology'

While there are many small-scale evaluations which substantiate claims that new technology can improve the quality of learning, there are also factors which temper an overly positive view of what technology can deliver.

First, much of the computer based teaching material has been undertaken for a university context, and for recognisable and fairly stable awards within which computer mediated study might still account for a very small proportion of students' study time. A survey of institutional use of ICT in 1998 gathered evidence, which appeared to show that 40% of institutions ranked their use of ICT for teaching as low, and only 4% said that usage was high. By contrast, 54% of institutions ranked their use for research purposes as high, and 37% their use for administration purposes as high also. The impact of TLTP materials is high in those disciplines where computing is essential to the research base - archaeology, veterinary science, biosciences, economics, and so on, but low in others where it is not (Haywood et al, 1999). Many students are thus still likely to spend most of their study time reading books, attending seminars and lectures and producing written papers.

We also lack evidence of the effectiveness of new technology for support of learning outcomes for pre-degree and vocational qualifications, in institutions other than universities and in the workplace. The OU's Learning Support for Small Businesses Project, in collaboration with the Universities of Central England and Wolverhampton and with the Birmingham City Council, aims to deliver training and business support via the Internet, to SMEs in the West Midlands. However achieving the goals of such projects is difficult. Employers want their workers to access only the immediately necessary, and in the shortest possible time. Providers find it difficult to match exactly the diversity of these needs, or provide just what is wanted, whenever it is wanted. While

new technology can in theory achieve workplace learning which is 'just in time and just enough', the reality is still some way off.

Second, lifelong learning is displaceable learning - it so often has to give way to demands for time from other areas. To take evidence from just one context, but in relation to thousands of adult learners, year on year, OU students who drop out from study, are surveyed and around a third respond that it is pressures from their work and family context that are the reason. About one fifth also say that they underestimated the time required for study. Qualitative studies have in addition shown how prior educational and learning experience can influence the likelihood of further study either positively or negatively, depending on the quality of that prior learning.

Furthermore, we may be open to the use of different media ourselves, but so time short that we can only take a 'satisficing' approach to learning. We have no time to do more than skim and sketch in the meanings of what we are learning and cannot give time to explore resources, check out conferences or bulletin boards for new understandings. Indeed, if anything could be a safe generalisation for adult learners below retirement age, (and for many, beyond it), 'time challenged' would apply to most. Where the effort of using new technology lengthens access to information or awareness, such learners will vote with their feet. We have evidence in an OU context for example that courses which use the computer as an essential requirement, whether for conferencing, delivery or CD-ROM access, typically require more time for study, if only because the set up and use of hardware and software is an add-on to the content of the course. We have also found that workplace learners do not necessarily want to use their computer for learning even where home access and personal skills are not at issue. One large employer engineered use of the same communications environment for OU study as for communication at work. Students hardly used it in part because they had had enough of interaction with their screens at work, and felt that their course units provided as much as they needed - or wanted - in order to get their MBA.

Cultural Factors

While new technology offers immensely powerful tools through which understanding can be initiated, scaffolded and resourced, our existing culture and circumstances as learners can erect barriers. Some of our preferences for or against particular media for example, reflect the impact of existing learning cultures, notably the assumption that what is in 'black and white' carries the greatest authority. Some learners are also highly instrumental, rejecting the possibility of deepening their learning if that requires additional time 'on task' using the media rich resources of a multimedia package. If the core texts are located in print materials, for these learners it is the print materials they will choose, whether or not these work as effectively for them or not.

Finally, issues of personal identity, self image and power come into play. Some learners welcome computer based study precisely because they do not have to interact with a teacher. The computer can deliver messages stripped of their power to embarrass or to remind the learner of their negative experiences in the past. Computer marked tests and computer based feedback offer preferred modes for some learners, whether because of release from negative aspects of their own identity or their past experiences of interactions around learning.

In the context of CMC, it has also been found that some learners communicate more easily at a distance because they are not intimidated by the impressions created by others in the group, or the dominance of a tutor (Mason, 1994, Joinson, 1998). Brookfield has commented on the strong preference adult educators have for the face to face circle of learners as the ideal, democratic 'theatre' for equality in interaction. He warns against this view, pointing out that the under confident can feel oppressed by this format, required to speak rather than freed by their position of apparent equality. The circle can be experienced as mandated disclosure, just as much as it can

be a chance for people to speak in an authentic voice' (Brookfield, 1998, p 140). Brookfield has begun to give his students permission to be silent if that is their wish, offering an explicit 'no-speech policy' as a way of creating a more positive inner freedom than the circle actually delivers.

It is interesting that experienced moderators of CMC are also recognising that the pejorative term for those who read but do not post messages, 'lurkers', fails to do justice to the nature of participation online, and the feelings that accompany participating. There are many recorded instances of learners who feel intimidated by the apparent expertise of those who do participate, and fearful of reactions to their own messages. Some learners therefore do not find CMC a liberating experience, and need much longer than average to become accustomed to the undermining effects of loss of familiar cues and conventions(see Feenberg 1989 for an excellent analysis of the decontextualising effects of CMC).

On the other hand, some learners feel released from aspects of their own identity and able to create an on-line identity which they may feel is in some ways different from their face to face interactions. Technology enables such post modern identity shifts, and there may be potential here for recreating confidence or more coherent identities, in lives which have been threatened by challenges to personal identity and stability, such as unemployment, or relationship loss may create (West, 1998, p 238).

Some forms of identity freedom have manifested themselves in disinhibited behaviour which can create stress for others, as in instances where 'flaming' occurs. Joinson has also explored the role of self awareness and visual anonymity, as helping explain the increased self-disclosure which has been noticed in CMC behaviour (Joinson, 1999). Research into use of the Internet is revealing how online behaviour manifests itself in ways which carry quite different outcomes for different people and their social networks. Some do reveal more of themselves and enter into new relationships online which may be more intense than those they have with old friends. Others may spend so much time online that their existing family and friendship circles suffer. Wallace quotes this rather apocalyptic vision of Stoll's, of the Internet as a negative force:
'It's an unreal universe, a soluble tissue of nothingness. While the Internet beckons brightly, seductively flashing an icon of knowledge-as-power, this nonplace lures us to surrender our time on earth. A poor substitute it is, this virtual reality where frustration is legion and where – in the holy names of Education and progress – important aspects of human interactions are relentlessly devalued.' (Stoll, 1995, quoted in Wallace, 1999, p.233)

Educators who have developed CMC learning environments have noticed from the beginning a small proportion of users who 'get hooked' and spend far more time online than the programme designers intended or felt was necessary to achieve the desired ends. 'The Internet as a time sink' is a telling phrase for the way in which, for all of us, this new technology sometimes has inefficiencies in information provision and communication, which make it more time consuming for simple transactions than old technologies such as the telephone (Wallace, 1999).

RESEARCH ISSUES

The scale of the task facing research here is enormous, given the early stage in our use of new technology. My suggestions are but a starting point, and reflect my own particular interests in the lifelong learning field. I have made suggestions in two areas: sub-degree and vocational learning, and genres/prototype development.

Vocational and sub-degree strategies

Inspite of the QUILT and FERL initiatives, we lack effective evaluations of how to use new technology to deliver the kinds of learning which are the focus for FE and workplace training. So much of the development work and evaluation has been done in HE, that we have little evidence for how to use the technology effectively outside this context. In the early eighties when Open and Distance Learning was taken up by industry and employers, the need for evaluation was shrugged off in the idea that 'they keep on buying the package so it must work'. This cannot be an effective approach where new technologies are concerned, and we must find ways of funding qualitative evaluations of technology in use for learning associated with vocational and sub-degree level study.

Genre studies and adaptable prototypes

CMC has generated an enormous literature because it uses off the shelf software such as First Class, WebCT etc, which providers can use relatively easily to encourage communication with and between their learners. What this literature shows us is how much richer and more subtle are the interactions we can create when we structure our environment and bring small groups of independent learners together, with the confidence to create their own knowledge (Musselbrook et al, 2000, Haughey and Anderson, 1998, Burge and Roberts, 1998) We have already learned enough for many to assert that this is a new medium, and that the skills of effective facilitation face to face are different and do not necessarily transfer. Computer mediated communication is but one 'genre' of new technology, and we are already aware of the diversity of ways in which it can be deployed.

We need a similar concentration upon other genres, to provide models for good practice and robust strategies, which have been proven across multiple usages and contexts. When the new applications are taken up for teaching and learning purposes, we need to evaluate and share our learning about what works, with whom, for what and in what circumstances.
Some key research question here:
How can designers/teachers provide the most effective trade-off for learners, between richness and complexity of the media/technologies used, against the 'pay off' in terms of learning outcomes and economy of time on task for the learner ?

How can learning providers ensure that evaluation is built-in and routine, and influences future course/materials design ?

How are minority learner needs best catered for, their interests built into design considerations along with the majority ?

How can we ensure that the diversity between learners in terms of their skills in using different media and technologies(including TV as well as the computer and hand held devices), is properly supported through the design of ICT based learning environments ?

How can we avoid media colonisation and media imperialism, whereby one medium, such as the Web, takes over roles more properly performed via other media, or soaks up investment in materials creation, to the detriment of other, cheaper media or media more accessible or effective for particular sub groups ?

How can we build learning communities which encourage active critical learners, and which build learner skills in learning across diverse environments and media models ?

Should we/can we avoid the promotion of learning as a lifestyle choice – ICT can blur the boundary between consumerism and learning ?

Concluding thoughts on institutional change

The purpose of this paper has been to open up issues not to come to conclusions. However it would be misleading not to mention the impact on public sector institutions for education and training which is being generated by the synergies between new technologies and lifelong learning. Edwards and Usher have drawn attention to the displacement of education by the discourse of lifelong learning and learners, dissolving the boundaries round education as a distinctive activity, 'invested with the missionary project of the educator' (Edwards and Usher, 1998, p.100). There is a growing integration between learning and commerce, which has markedly accelerated with the arrival of technologies that enable intensive communication and interaction at a distance. The pages of the Times Higher provide ever new examples of partnerships between public sector education institutions the world over, and corporations from the worlds of publishing, telecommunications and broadcasting, who are linking up in order to sell content to business as well as individuals.

The latest at the time of writing, is a double spread coverage which takes in the World Education Market in Vancouver, the African Virtual University, Universitas 21 and its negotiations with News Corporation to form a joint venture company (THES, May 19th 2000). With the exception of AVU which is World Bank sponsored, the language is also straight from commerce - intellectual property, the brand name, revenue stream and so on. The quoted comments of the vice-chancellor of Melbourne, chairman of Universitas 21 assert that 'e-education is the way to go'. Neither individual campus 'brands' nor 'old-fashioned forms of pedagogy and their adaptation (sic) to distance education' are the way ahead. Instead, the global market requires a global brand and custom designed e-education programmes. It is hardly surprising to find on the same page that Canada's Council of Ministers of Education are concerned to prevent their country's public education curriculum from being effectively dominated by commercial suppliers of materials.

Whatever the chances of the Canadian ministers, they will not be able to put the genie back into the bottle, and none of our public sector institutions face anything other than continual change, and in some cases collapse or mutation into a radically different kind of organisation. Barnett has called this an age of super complexity (Barnet, 2000), but it is also an age which requires good strategies for institutional survival. The impact on research of this flux and uncertainty is likely to be mixed. Some of the issues raised require long term commitment to essential data collection and monitoring of change. They also suggest that sectors which have not traditionally been effectively resourced to do evaluation let alone research – FE notably – require such resource if we are to use new technologies effectively. As Mayes has emphasised, greater insight into pedagogic innovation may be gained through 'focusing on the social dimension of communities of learners' and thus we cannot afford to ignore learning contexts and the effects upon them of institutional change and discontinuity (Mayes, 2000).

There may be little chance of taking up the research challenges we currently face, unless we are prepared to assert the need for resources channelled to key areas. It is undoubtedly a period of 'interesting times' and one in which lifelong learning is also creating new research opportunities and attracting new interest. We shall need shared values to help drive collaboration, and these might be found through constructing research agendas such as the present exercise of the colloquium.

REFERENCES

Barnett, R. (2000) *Realizing the university in an age of supercomplexity*, Buckingham: Society for Research into Higher Education and Open University Press

Bostock, S. (2000) Virtual Learning Environments in Educational Developments, issue 1.1, 17 - 18

Brookfield, S.(1998) Against Naive Romanticism: from celebration to the critical analysis of experience, Studies in Continuing Education, vol.20, no.2, pp.127-42.

Burge, L. and Roberts, J.M. (1998) Classrooms with a difference: Facilitating learning on the information highway, Montreal: Cheneliere/McGraw-Hill

Edwards, R. (1997) Changing Places ? Flexibility, Lifelong Learning and a Learning Society, London: Routledge

Edwards, R. and Usher, R. (1998) Lo(o)s(en)ing the Boundaries: from "education" to "lifelong learning", Studies in Continuing Education, Vol. 20, No. 1, pp83 - 103

Feenberg, A. (1989) The Written World, in Mason, R. and Kaye, A. (eds) *Mindweave*, Oxford: Pergamon, pp 22 – 39

Field J. and Schuller, T. (1999) Investigating the Learning Society, Studies in the Education of Adults, vol.31, no.1, pp.1 - 9.

Haywood, J. Anderson, C., Day, K. Land, R. and Macleod, H. (1999) Use of TLTP materials in UK higher education, Edinburgh, Centre for Teaching, Learning and Assessment, Department of Higher and Further Education

Haughey, M. and Anderson, T.(1998) Networked learning: the pedagogy of the Internet, Montreal: Cheneliere/McGraw-Hill

HEFCE, September 1998/47 Review of CTI and TLTSN: An evaluation of the Computers in Teaching Initiative and Teaching and Learning Technology Support Network, Bristol: Higher Education Funding Council for England

Joinson, A. (1998) Causes and Implications of Disinhibited Behavior on the Internet, in XXX Psychology and the Internet: Intrapersonal, Interpersonal, and Transpersonal Implications,

Joinson, A. (1999) Self-disclosure in computer-mediated communication: The role of self-awareness and visual anonymity, Milton Keynes: Institute of Educational Technology, Open University, mimeo

Jones, A. Barnard, J. Thompson, J. Calder, J. and Scanlon, E. (1999) Learning with IT; Final Report RPM 050, Milton Keynes: The Open University, Institute of Educational Technology

Kirkup, G. and Jones, A. (1995) New Technologies for Open Learning: The Superhighway to the Learning Society, in Raggatt, P., Edwards, R. and Small, N. (eds) The Learning Society: Challenges and Trends, London: Routledge, pp 272 -292,

Laurillard, D. (1993) Rethinking University Teaching: a framework for the effective use of educational technology, London: Routledge

Mason, R. (1994) Using Communications Media in Open and Flexible learning, London: Kogan Page

Mayes, T. (2000) Pedagogy, Lifelong Learning and ICT, Centre for Research in lifelong Learning, Gasgow Caledonian University (Mimeo)

Musselbrook, K., McAteer, E. Crook, C. Macleod, H. Tolmie, A. (2000) Learning networks and communications skills, Association for Learning Technology Journal, vol. 8, No. 1 71 – 79

Office for National Statistics, (1999) Social Trends 29
Office for National Statistics, (2000) Social Trends 30, Her Majesty's Stationery Office, London

Scott, P. and Phillips, M. (1998) Developing Web-based student support systems: telling student stories on the Internet, in Vincent, T. and Eisenstadt, M. (eds) The Knowledge Web: Learning and Collaborating on the Net, London:Kogan Page

Squires, D. (2000) The impact of ICT use on the role of the learner, Lifelong Learning in Europe, Vol. V, issue 1, pp 55 – 61

Stoll, C. (1995) *Silicon snake oil*, New York: Anchor Books

Taylor, J. and Tosunoglu, C. (1999) M206 Evaluation Report 1998, Programme on learner use of Media, Paper No. 122, Milton Keynes: The Open University, Institute of Educational Technology

Vincent, T. and Whalley, P. (1998) The Web: enabler or disabler, in Vincent, T. and Eisenstadt, M. (eds) The Knowledge Web: Learning and Collaborating on the Net, London:Kogan Page

Wallace, P.M. (1999 *The psychology of the Internet*, Cambridge: Cambridge University Press

Watt,S. and Paterson, L.C. (2000) Pathways and Partnerships: widening access to higher education, Journal of Further and Higher Education, Vol. 24, no. 2, pp 107 - 116

West, L. (1998) The Edge of a new story ? On paradox, postmodernism and the cultural psychology of experiential learning, Studies in Continuing Education, vol. 20, no 2, pp 235 - 249
Knowledge Management, Knowledge Development